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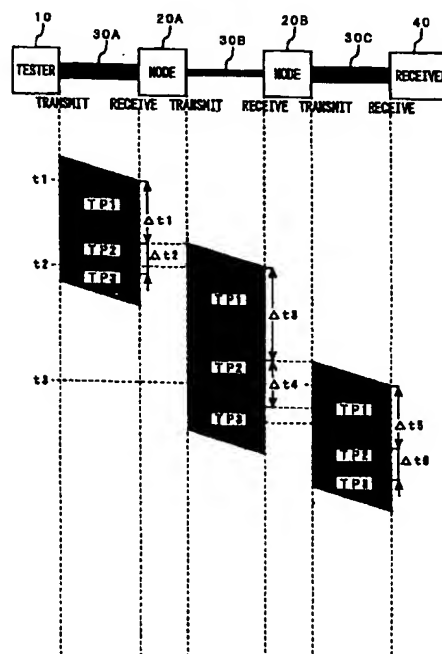
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Tokyo (JP)

### (54) Band width measuring method and apparatus for a packet switching network

(57) The invention provides a bandwidth measuring method and apparatus for a packet switching network in which a bandwidth of a link that is distant from a tester that transmits test packets, specifically a bandwidth distant beyond a bottleneck, can be measured. A feature of the present invention is to that, a bandwidth measuring method for a packet switching network in which a bandwidth of a packet switching network comprising a plurality of nodes for packet switching connected mutually is measured, said method comprising a procedure in which a plurality of test packets which at least include two test packets having different packet length are fed to the packet switching network so that in said two test packets, the test packet having a long packet length and the test packet having a short packet length are successive in this order, and a procedure in which a receiver receiving each test packet determines an immediately former bandwidth based on the difference in the reception completion timing thereof.

Fig. 1



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# EUROPEAN SEARCH REPORT

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EP 00 10 8041

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
Y	LAI K ET AL: "MEASURING BANDWIDTH" PROCEEDINGS IEEE INFOCOM. THE CONFERENCE ON COMPUTER COMMUNICATIONS, US, NEW YORK, NY: IEEE, 21 March 1999 (1999-03-21), pages 235-245, XP000868806 ISBN: 0-7803-5418-4	1,2,4	H04L12/26
A	* page 236, Section II.C * * pages 238-239, Section IV.B * * pages 239-240, Section IV.D *	3	
Y	EP 0 522 211 A (HEWLETT PACKARD CO) 13 January 1993 (1993-01-13) * column 10, line 58 - column 11, line 16 *	1,2,4	
A	* figure 8 * * claims 1,2,5,14 *	3	
A	VERN PAXSON: MEASUREMENTS AND ANALYSIS OF END-TO-END INTERNET DYNAMICS, PHD DISSERTATION, 'Online! April 1997 (1997-04), XP002155824 Retrieved from the Internet: <URL:ftp://ftp.ee.lbl.gov/papers/vp-thesis/dis.pdf> 'retrieved on 2000-12-14!' * page 255, paragraph 2 * * pages 256-257, section 14.3 *	1-4	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			H04L
The present search report has been drawn up for all claims			
Place of search <b>THE HAGUE</b>		Date of completion of the search <b>20 December 2000</b>	Examiner <b>Bertolissi, E</b>
<p><b>CATEGORY OF CITED DOCUMENTS</b></p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons A : member of the same patent family, corresponding document</p>			

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# EUROPEAN SEARCH REPORT

Application Number  
EP 00 10 8041

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	<p>SRINIVASAN KESHAV: "A CONTROL-THEORETIC APPROACH TO FLOW CONTROL" COMPUTER COMMUNICATIONS REVIEW, US, ASSOCIATION FOR COMPUTING MACHINERY. NEW YORK, vol. 21, no. 4, 1 September 1991 (1991-09-01), pages 3-15, XP000234922 ISSN: 0146-4833 * page 3, Section 1. Introduction * * pages 5-6, Section 4. Detailed Dynamics of Packet-Pair *</p>	1-4	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
The present search report has been drawn up for all claims			
Place of search <b>THE HAGUE</b>		Date of completion of the search <b>20 December 2000</b>	Examiner <b>Bertolissi, E</b>
<p><b>CATEGORY OF CITED DOCUMENTS</b></p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons * : member of the same patent family, corresponding document</p>			

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 00 10 8041

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on  
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20-12-2000

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0522211     A	13-01-1993	DE 69116685 D	07-03-1996
		DE 69116685 T	30-05-1996
		WO 9222967 A	23-12-1992
		JP 6508008 T	08-09-1994
		US 5477531 A	19-12-1995
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82